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HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objective stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

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Systemic Causes of Abdominal Pain
Part I

A brief history and physical examination often immediately establishes the cause of abdominal pain. The physician identifies the disease entity in the same way that he recognizes the age of an octogenarian. It is not the scanty white hair alone—it is the entire picture that allows justifiable conclusions. Similarly, one has little difficulty diagnosing appendicitis when a text-book picture is presented. Not infrequently the cause of abdominal pain is not so classical. Many diseases cause abdominal pain in overlapping and similar patterns and no wise physician fails for long to be impressed with his own fallibility.

When the cause of a well-described abdominal pain is obscure, it is rewarding to approach the problem in an orderly manner. Such an approach is possible in two ways: to consider the neuroanatomy of the painful region, and to see how well the particular clinical facts can be explained by the characteristics of those diseases capable of producing abdominal pain.

The first method is exemplified by differential diagnosis of chronic right upper quadrant pain. Attention is focused on the organs from which right upper quadrant pain may arise: liver and biliary tract, pancreas, hepatic flexure of the colon, adjacent muscles and portions of the pleura, kidney, stomach and duodenum, parts of the thoracic spine and cord, and possibly others. Review of features of the illness that suggest involvement of one of the structures named is made, and procedures or laboratory tests are completed to determine the validity of plausible anatomical possibilities.

The second method does not confine itself to the immediate neural connections of the painful region. It begins with a categorical review of disease that can cause pain in the abdomen and clinical facts are questioned to determine whether they are compatible with various possibilities and whether special procedures are necessary to establish the presence or absence of one or more of these diseases. This method is often a necessary supplement to the anatomical method for two reasons: viscera sometimes cause pain in unusual and unpredictable places, and detection of the precise anatomical location of the lesion that causes abdominal pain is not always possible.

An example of the first anatomically confusing situation is the patient with peptic ulcer who complains of lower abdominal pain relieved by eating. One possible explanation is the summation of stimuli, postulating that subliminal impulses over the pain tracts from the bowel (due perhaps to a spastic colon) are added to similar impulses from the duodenum with resultant pain referred to the lower point. Whatever the reason for such atypical pain syndromes, the patient must always be the final arbiter of the location of the pain. The second type of anatomically confusing situation—the diseases whose pain-producing lesions are impossible or difficult to locate—present frustrating problems. These are the subject of the author's discussion.

Diseases Due to Hypersensitivity. Certain acquired diseases of connective tissues are usually loosely called "collagen diseases." The relationship of these entities is controversial. Clinically they are confused with one another and with a great many other diseases. Their clinical manifestations may involve any part of the body, and among the symptoms they produce is puzzling abdominal pain. Sometimes the pain has a discernible cause, as in the sterile peritonitis of rheumatic fever or lupus, the gross infarctions of bowel or spleen in polyarteritis, the ulcerated bowel of lupus, the radiologically peculiar bowel infiltrations of scleroderma, and pancreatitis caused by lupus or polyarteritis. In addition, the so-called collagen diseases not infrequently give rise to mild or severe abdominal pain, of no consistent type or pattern, for which a specific anatomical cause is never found.

Abdominal pain may be caused by a known allergin, as in a specific drug sensitivity or injection of horse serum, and abdominal pain may be a prominent feature of nonthrombocytopenic purpura whether an allergin has been incriminated or not. Abdominal pain may be produced when the sensitive individual is exposed to the allergin through any route, not necessarily by ingestion. In most instances, abdominal pain is neither the sole nor cardinal manifestation of the illness, but in any given case of allergic purpura or of serum sickness separate signs of those diseases may appear in all possible combinations and permutations.

Without detracting from the importance of allergy as a cause of abdominal pain, it must be confessed that recurrent or chronic abdominal pain is sometimes blamed on allergy when there is no evidence to support such a diagnosis. The patient may prefer a phantom allergy to the scrutiny of real emotional turmoil, and the physician may encourage this deception for one or more reasons.

Infections. In some instances, abdominal pain is the initial complaint in an illness as remote from the abdomen as streptococcal pharyngitis, influenza, or measles. Ordinarily, malaise and signs of systemic disease serve to minimize the deceptive localizing importance of abdominal pain. Certain specific infections—liver abscess of a staphylococcal septicemia, for example—may produce severe abdominal pain as a result of lesions in or near the abdomen. More often the lesion incites but does not require surgical treatment and the latter only aggravates the infectious process. Therefore, it is important to be wary of infections which are notorious for their imitation of a surgical abdomen, as "intestinal flu" and similar conditions. Less common infectious impersonators of a surgical abdomen are bacterial enteric pathogens, amebiasis, malaria, trichinosis, subacute bacterial endocarditis, rickettsial diseases, infectious mononucleosis, herpes zoster involving roots of an abdominal nerve, epidemic pleurodynia, gonorrhea in women, and mumps.

Toxins. Abdominal pain is frequently caused by enterotoxins found in food, such as that produced by staphylococci. Clostridium botulinum produces a far more formidable toxin. Other foods contain intrinsic substances which

are toxins and often produce abdominal pain. Among these are the meat of some species of fish or mussels, mushrooms, grains contaminated with ergot fungus, milk from cattle that have been eating certain plants, raw sprouting potatoes which contain solanin, and various other normally edible materials.

Drugs are not without potentiality for causing abdominal pain. The pharmacopeias of the world are saturated with chemicals and compounds whose toxic manifestations include nausea, anorexia, and abdominal pain. It should be remembered that native sensitivity of individuals to any single toxic effect of a drug is tremendously variable, not to mention the possibility of allergy.

The list of chemicals capable of producing abdominal pain is lengthy. Any adult suffering from abdominal pain of obscure origin should be questioned carefully as to occupation, habits of cooking or eating, and chemicals used in the household chores, gardening, or hobbies.

Abdominal pain following a bite by the black widow spider may be agonizing. Often, the causative bite of arachnidism has not been recognized as it usually has been of little moment to the individual bitten. Acute symptoms last 12 to 24 hours and include muscular spasm severe enough to create a board-like abdominal wall. Careful attention to all possible etiological factors will prevent adding laparotomy to the misery inflicted by the spider.

Metabolic Diseases and Electrolyte Disturbances. Abdominal pain may arise when the body's electrolyte balance is seriously disturbed. The faster the departure from normal ionic equilibrium, the more likely it is that smooth muscular contractions of the stomach and intestines will be augmented, depressed, or rendered dysrhythmic to the point of producing abdominal pain of various types and/or nausea and vomiting, diarrhea, or constipation. The situations that create these conditions are ordinarily simple, as in heat cramps produced by excessive sweating without adequate sodium replacement. Abdominal pain may be found, however, in complex electrolyte disorders, as in hepatic or renal diseases in which sodium, potassium, calcium, and chlorides may be diluted or concentrated—depending upon the circumstances—and in which acidosis, alkalosis, dehydration, or water intoxication may be produced by erroneous treatment or therapeutic inactivity. Probably the commonest electrolytic causes of marked abdominal pain or discomfort are hypokalemia and hypercalcemia.

Uremia may be accompanied by a great variety of electrolyte disorders, the type depending upon underlying renal disease, speed with which renal failure has developed, complications, and treatment. Nevertheless, it is clear that uremia includes much more than any known electrolyte disturbance. The mechanisms through which renal failure causes disordered motility of the stomach and intestines are very poorly understood and probably include as yet unidentified metabolic defects.

Hepatic insufficiency of any type, beyond its role in electrolyte disorders, sometimes promotes dysfunction of the stomach and bowel through mechanisms as yet not clarified. Pellagra causes diarrhea, and, along with other vitamin deficiencies is known to produce abdominal cramps and other gastrointestinal pains probably due to alterations in smooth muscle tone and motility.

Diabetic acidosis is a condition in which causes of abdominal pain are interrelated with electrolytic and metabolic defects. Other endocrine disorders frequently presenting abdominal pain include Cushing's syndrome, Addison's disease, medullary tumors of the adrenal gland and hyper- or hypofunction of the thyroid and parathyroid glands.

Several inborn errors of metabolism may cause severe abdominal pain simulating a surgical emergency—porphyria, hyperlipemia, and hemochromatosis.

Periodic Peritonitis. Occasionally a benign self-limited form of acute peritonitis is seen, in a single attack or recurrently, for which no cause is found. In certain families such attacks of peritonitis—and sometimes pleuritis—are apparently inherited. The etiology is not known and the condition has been described variously as "periodic peritonitis," "Armenian Disease," and familial Mediterranean fever. (Mellinkoff, Sherman M., Systemic Causes of Abdominal Pain: Am. J. Digest. Dis., 4: 563-580, July 1959) (To be concluded)

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Tobacco Consumption and Mortality

Employing the resources of the Veterans Administration in relation to the causes of death among 200,000 policyholders of U.S. Government life insurance, the author applies statistical analytical methods and makes determinations of the relationship between a history of smoking and cause of death from cancer and other diseases. The data presented are based on 478,952 person-years of exposure of which 87,774 were contributed by persons who had never smoked.

The largest increase in mortality among persons who have smoked is found for those who have regularly smoked only cigarettes, being 58% higher than that for nonsmokers. Regular cigarette users who had stopped smoking prior to the start of the study have a lower death rate than persons who continued to smoke. Nevertheless, their death rate on the average still exceeds that for nonsmokers by 30%.

The excess mortality of cigarette smokers is directly related to the average daily number of cigarettes smoked. Those who smoke two packs or more a day have the highest death rate—a rate averaging nearly twice that for nonsmokers. Only very heavy cigar or pipe smokers experience a higher mortality than nonsmokers.

By far the greatest increase for smokers in the risk of developing a disease is that for lung cancer. For all persons who had ever smoked, the observed number of cases of lung cancer was 312 compared with 52 expected—a mortality ratio of 6.0. For no other disease does the excess mortality among smokers approach that for lung cancer, with the next highest ratio being for a group of respiratory diseases including pulmonary tuberculosis, asthma, bronchitis, emphysema, pneumonia, and pleurisy.

Nearly two-thirds of the deaths of persons who had used tobacco were attributed to diseases of the cardiovascular-renal system including chronic nephritis, arteriosclerosis, hypertension, rheumatic heart disease, chronic endocarditis, and coronary occlusion, sclerosis, and thrombosis. The risk of dying from one or more of these diseases is 31% greater for regular smokers than for nonsmokers. The death rate from coronary heart disease among regular users of cigarettes only is 63% higher than the rate for nonsmokers.

Mortality ratios for cancer other than cancer of the lung are similar in magnitude to those for cardiovascular diseases.

Smokers have no greater risk of committing suicide or of being killed in an accident than do nonsmokers.

Diseases with a mortality ratio greater than 2.0 signifying a death rate more than double that for nonsmokers are bronchitis, emphysema, and allied respiratory diseases, cirrhosis of the liver, ulcer of the stomach or duodenum, cancer of the prostate, and cancer of the esophagus and buccal cavity. Several studies have reported that heavy smokers also tend to drink alcoholic liquors excessively so that the increased death rate from cirrhosis of the liver may reflect the effect of the consumption of alcohol rather than any effect of cigarette smoking. (Dorn, H. F., Ph. D., Tobacco Consumption and Mortality from Cancer and Other Diseases: Pub. Health Rep., 74: 581-593, July 1959)

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Clinical Characteristics of Leptospirosis

Early discussions of leptospirosis primarily dealt with Weil's disease, a severe clinical syndrome characterized by fever, jaundice, renal damage, and hemorrhage. In recent years, attention has been drawn to the fact that leptospirosis is usually a mild disease in which jaundice and significant renal damage are unusual, and that this mild form can result from infection with any of the leptospiral serotypes.

Twelve sporadic cases of leptospirosis were studied by the author for analysis of the clinical characteristics. One feature was the biphasic nature of the illness. Initially, there was a 5 to 7-day period of fever, chills, headache, myalgia, conjunctivitis, and gastrointestinal symptoms. This was the "septicemic" stage as the organism was recovered from blood and cerebrospinal

fluid in a high percentage of cases. The second stage began when defervescence and symptomatic improvement occurred, usually on the sixth or seventh day. Shortly following the end of the first stage there was a secondary rise in temperature and development of meningitis, either asymptomatic or clinical. The blood and cerebrospinal fluid were sterile during this stage, but antibodies appeared in the blood in rapidly rising titer. The author considers that second-stage manifestations are primarily due to hypersensitivity and he proposes that this phase be designated the "immune" phase, with the previously suggested terms "icteric" and "toxic" being inappropriate because of the low incidence of jaundice in leptospirosis in general, and because of the lack of evidence that toxins are important in the production of principal manifestations.

In the first stage, fever, chills, and headache occurred in all patients. The fever rose to 104° F. or higher, and chills were recurrent in the majority of cases. The onset was abrupt in the typical occurrence. Headache—also seen in all cases—was usually frontal in location, intense, and unremitting. Myalgia, conjunctivitis, and anorexia were other frequently occurring manifestations. Hematemesis and melena, reported by others, was not observed. A blotchy, erythematous eruption occurred in only two patients, and jaundice in one.

Routine laboratory observations disclosed little significant change in the leukocyte count other than in the jaundiced patient who had a 35,000 count on one occasion. Neutrophilia was a constant finding, along with an elevation of the sedimentation rate. Proteinuria and cylindruria were detected in two-thirds of the patients seen in the first stage, but the urine rapidly cleared after defervescence. The anicteric patients had only minor disturbances of liver function tests while the jaundiced patient had both clinical and laboratory evidence of severe hepatic damage.

The second state in anicteric patients was remarkably benign. Several, including some who had overt meningitis, were clinically well by the 10th or 11th day of illness. The jaundiced patient had slow recovery and was febrile until the 17th day and did not complete diuresis until the 23rd day. The prognosis in anicteric leptospirosis is universally good and residual damage in any type of leptospirosis is rare.

During the second stage, fever is common, but is low and of short duration. Since the blood and cerebrospinal fluid are sterile in the second stage, and symptoms develop at a time when antibody titers are rising and leptospires are being destroyed, development of an allergic state is possible.

Meningitis is the principal second stage manifestation, and occurred in 10 of the 12 patients observed. It usually occurred 12 to 24 hours after the defervescence of the first stage, heralded by sudden recurrence of headache or intensification of a persisting headache. Nuchal rigidity in the first stage was considered not to be indicative of meningitis, but to be a result of diffuse myalgia, while in the second stage, nuchal rigidity was occasionally absent

even in the presence of symptomatic meningitis. Initial pleocytosis, up to 533 cells/cmm., was of the neutrophil cell type in 4 and lymphocyte in 6 patients, but lymphocytes predominated after the 12th day. The protein contents varied from normal to 140 mg./100 ml., and the sugar was normal or slightly elevated.

The author is in agreement with the theory that an antigen-antibody reaction, rather than a manifestation of direct injury to the meninges by leptospires, explains the development of meningitis. He considers that this theory explains virtual absence of pleocytosis in the first stage, abrupt onset of meningitis around the 7th day, rapid disappearance of leptospires from the cerebrospinal fluid after onset of meningitis, good prognosis, and lack of correlation between severity of meningitis and manifestations of virulence. High incidence of meningitis is explained by the remarkable ability of leptospires to enter the cerebrospinal fluid during the septicemic phase.

Diagnosis of leptospirosis depends on: (1) isolation of leptospires from blood; (2) fourfold or greater rise in complement-fixing or agglutination-lysis antibody titers, or both, during course of illness; (3) sustained titer of 1:40 or greater by complement fixation or 1:400 or greater by agglutination-lysis when the first serum specimen was obtained on or after the 7th day of illness. The experience of the author did not support the view that different leptospiral serotypes cause distinctive clinical patterns of disease. Special diagnosis was impossible on the basis of clinical patterns of disease.

Names, such as "mud fever," "swamp fever," and "swineherd's disease," the author considers should be used only to draw attention to the epidemiological features of a given case, not to identity of the serotype, and use of the terms, "Weil's disease" and "pretibial fever" should be limited to the description of certain syndromes rather than as synonyms for infection with specific organisms.

There is every reason to believe that leptospirosis is widespread in the United States, just as it is throughout the world. No doubt leptospirosis is present in many patients and is now being called "summer influenza," "aseptic meningitis," and "nonparalytic polio." Among inhabitants of villages and rural areas leptospirosis is predominant in the summer and autumn, but among urban residents the seasonal incidence is less marked. As physicians become increasingly aware of the milder leptospiral infections, and with improvement in laboratory facilities for diagnosis, the number of cases being reported to public health agencies should be greatly increased.

The greatest danger of infection in man is from contact with stagnant water to which wild or domesticated animals have access, but infection may result from direct contact with the urine of infected animals as well. (Edwards, G.A., Clinical Characteristics of Leptospirosis: Am. J. Med., 27: 4-16, July 1959)

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Cushing's Syndrome

Recognizing that early diagnosis is of strategic importance in improving prognosis in individuals with Cushing's syndrome, the authors reviewed a series of 34 cases at the Lahey Clinic, placing emphasis on early symptoms and problems they may cause in differential diagnosis.

The syndrome—a result of adrenocortical hyperfunction—has an estimated duration from onset to death of slightly over 5 years, with death usually being brought on by infection, complications of cardiovascular disease, or neoplastic disease. Treatment, reflecting recent advances in physiological understanding, yields more satisfactory results with early institution of specific measures as the ravages of the disease are in part proportional to the length of time the disease has been present.

Insidious onset is commonly considered the picture of adrenal hyperplasia, with rapid onset being characteristic of adrenocortical tumor. In the series studied by the authors, 24 (71%) presented initial manifestations that were dramatic enough to alert both the patient and the physician, with 5 of the group exhibiting remittent characteristics. Yet, of this group, 19 presented adrenocortical hyperplasia and 3 were diagnosed as adrenocortical tumor. Typifying these were 8 cases in which the disease began with edema of the legs and face accompanied by some other sign such as amenorrhea, renal colic, acne, hirsutism, bruises, weakness, mental symptoms, or diabetes mellitus.

There were 10 cases (29%) with gradual onset, with clinical manifestations of mental changes, oligomenorrhea, gradual weight increase, hypertension, sterility, and diabetes mellitus—among others—so that no definite date could be ascribed to their initial appearance.

Considering possible precipitating factors, emotional strain before onset of symptoms was described by several patients, and surgical or traumatic stress was considered to be related to onset in others.

Facial edema was a diagnostic pitfall in many cases, with hypothyroidism being diagnosed or suspected at some time in 7 patients, even though there were other signs inconsistent with this diagnosis. Hyperthyroidism was diagnosed in others because of increased nervousness among other symptoms. A clue to be sought in the differential would be contradictory information of the basal metabolic rate and blood cholesterol. Individual determinations of cholesterol, basal metabolic rate, or radioiodine uptake may be normal, high, or low.

Because of facial edema, the diagnosis of renal disease was made in some cases, while more widely distributed edema seemed to indicate cardiac or liver disease in others. A wide variety of skin changes, in addition to edema, led to further confusion. Thick skin and muscle weakness led to the diagnosis of dermatomyositis in one patient. The probable cause for the edema is a combination of factors including the tendency to

hypernatremia, hypoproteinemia, and vascular fragility, all of which occur to varying degrees in Cushing's syndrome.

Mental change was encountered frequently (88%) misleading the physician making the original diagnosis to consider psychosomatic disease. Major mental changes were seen in 6 patients. Variations of the emotional and mental picture may constitute a real stumbling block in the diagnosis of this syndrome.

Diagnosis in the group with more insidious onset presented even more confusing diagnostic pictures. Among the more common findings were obesity, hypertension, hirsutism, diabetes mellitus, amenorrhea, and mental changes. Some helpful pointers in diagnosis are: combined appearance of high hemoglobin and leukocytosis with relative lymphopenia and eosinopenia; very high incidence of fatigue and weakness; nervous complaints; and striking change in appearance. Thoughtful analysis of the various factors presented, along with determination of the 17-hydroxycorticosteroid output, alone or after ACTH stimulation, should help to establish the diagnosis in the majority of such cases. In the list of differential problems, hypertension needs emphasis.

Among the complications, osteoporosis—resulting from negative protein and calcium balances—is commonly seen as an early sign which may lead to pathologic fractures. Renal calculi may result from the same imbalance. Hypertension may be a sign as well as a complication, persisting in remission. Other cardiovascular complications are well known. Infections have been the greatest single cause of death in the past and, despite antibiotics, are still a problem. Duodenal ulcers occurred in 3 of the 34 patients studied by the authors, with perforation occurring in one after years of intermittent ulcer symptoms. Three patients developed symptoms and signs of multiple peripheral neuritis, typical of Guillain-Barré syndrome, but without cranial nerve involvement.

It is known that patients with Cushing's syndrome show enormous variations in excretion of steroids as determined by serial excretory estimations. It would seem correct, therefore, to state that type of onset, course, and manifestations of the disease at any given time will depend upon the amount and type of steroid secretion. A prolonged period of slight increase in steroid production by the adrenal glands may cause symptomless changes until the stress of a complication, such as ulcer perforation or renal colic, triggers more obvious signs by resultant increased secretion. Therefore, remissions may be assessed accurately only after serial repeated laboratory studies, and without reliance on symptoms and more obvious signs.

Cushing's syndrome is a rare disease. This fact alone makes it interesting, but its curability makes it a disease with which not only the endocrinologist but also every practitioner should be familiar. Unrecognized, irreversible changes may occur and fatality may be a result of complications. (Hurxthal, L. M., O'Sullivan, J. B., Cushing's Syndrome - Clinical Differential Diagnosis and Complications: Ann. Int. Med., 51: 1-15, July 1959)

Prophylaxis of Streptococcal Infections

The relationship between group A streptococcal infections and the subsequent occurrence of rheumatic fever has been well established. It has also been shown that initial and recurrent attacks of rheumatic fever can be prevented if streptococcal infections are prevented or effectively treated. Sulfadiazine and penicillin, two of the most commonly used agents for prophylaxis, have been effective in reducing the incidence of recurrence of rheumatic fever but they both present the feature of producing undesirable reactions in 2 to 10% of the patients. In addition, the protection afforded by sulfadiazine is not complete. Because of these deficiencies other antimicrobial drugs might prove to be more ideal. The authors explored the possibility of employing erythromycin, an agent effective against group A streptococci and relatively nontoxic.

Fifty patients with acute rheumatic fever or rheumatic heart disease were followed for an average of 19 1/2 months. While the number of patients was small, erythromycin probably was more effective than sulfadiazine, as only one patient receiving erythromycin acquired a group A streptococcus while seven of the group receiving sulfadiazine acquired the coccus. None of the patients receiving erythromycin for 9 to 24 months developed any type of reaction to the drug.

One child in the study—in the sulfadiazine group—developed a recurrence of rheumatic fever. When seen with an acute throat infection, accompanied by a positive throat culture and antistreptolysin rise, this patient already had a swollen joint. It is not known if recurrences in other patients were prevented by prompt treatment of their streptococcal infections with penicillin, but this seems a possibility since a high percentage of rheumatic patients develop recurrence following untreated streptococcal infections.

Streptococci other than the group A type were isolated from these patients while under treatment and observation. Rheumatic fever has not been associated with hemolytic streptococci other than group A, so the occurrence of these organisms in the patients receiving prophylaxis is of no significance as far as recurrences of rheumatic disease is concerned. On the other hand, since one group cannot be differentiated from the other by cultural characteristics, and because there is usually a delay of several days in the group classification of streptococci, it is necessary to institute therapy without delay in order to be certain that all group A streptococci are eradicated.

It has been emphasized that patients who develop rheumatic fever following streptococcal infections show unusually high rises in antistreptolysin 0 titers. It has also been shown that prompt eradication of strepto-

cocci from the throats of patients will result in a reduced or absent antistreptolysin response. The development of significant antistreptolysin rises in only three of the eight patients from whom group A streptococci were isolated was probably due to the prompt and vigorous use of penicillin in these patients. (Stahlman, M. T., Denny, F. W., Jr., The Prophylaxis of Streptococcal Infections in Patients with Rheumatic Fever: A. M. A. J. Dis. Child., 98: 66-71, July 1959)

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Psoriatic Arthritis

Many attempts have been made to define the entity, psoriatic arthritis. Some definitions have required a reasonable amount of synchronous activity—remissions and relapses in arthritis and cutaneous manifestations, arthritis restricted to distal interphalangeal joints, or a peculiar destructive form of arthritis associated with psoriasis. Hensch defined it as an atrophic arthritis following long continued and uncontrolled psoriasis.

It is difficult to estimate the incidence of the association of the two diseases. Depending on which feature predominates, the patient may go to the dermatologist or rheumatologist and escape the statistical eye of the other.

In recent years workers with the Rose-Waaler sheep cell agglutination test (SCAT), which is positive in 80% of patients with rheumatoid arthritis, have observed that most patients who had psoriasis and atrophic arthritis had a negative test. The present study analyzed 154 patients with psoriasis and various rheumatic complaints, comparing them with control groups of patients with uncomplicated rheumatoid arthritis and uncomplicated psoriasis respectively, in an attempt to resolve some currently conflicting views.

As a result of his comparative analysis, the author considers confirmation given to the belief that psoriatic arthritis is a distinct entity. The syndrome is characterized by a negative SCAT, whereas patients with coincidental rheumatoid arthritis and psoriasis have a positive SCAT. The clinical course of the latter patients does not differ from those with uncomplicated rheumatoid arthritis.

Psoriatic arthritis may be virtually indistinguishable from rheumatoid arthritis except that the age of onset is earlier, fewer joints are involved, and it is less disabling. It may, however, present primarily as distal joint arthritis closely associated with nail changes, or as a severely deforming type of arthritis.

Some authorities have suggested that hemolytic streptococcus is the common etiological agent in psoriasis and its associated arthritis. This

relationship was not confirmed by the author's observations. The familial trend of the disease was evident in the study with previous evidence indicating a modified dominant genetic character.

Only in deforming arthritis was psoriasis extensive. Contrary to some reports, the soles and palms were not involved more often in psoriatic arthritis, and pustular lesions which have been described as characteristic were only found significantly more often in deforming arthritis. Nail changes, commonly observed in psoriatic arthritis were seen in 81%, compared with 32% of the control group with uncomplicated psoriasis. There was a closer association between nail and joint changes than skin and joint lesions. The fact that a high incidence of nail changes was found with coincidental rheumatoid arthritis and psoriasis raises the possibility that such changes may not be specific for psoriatic arthritis but occur with any type of erosive arthritis. In patients with distal joint arthritis, however, the association appeared closer. The relation of involvement of the terminal phalanges to nail lesions may result from vascular changes, for it is known that similar changes may occur in vascular disorders, such as Raynaud's disease.

Although evidence suggests a close relation between psoriasis and arthritis in some patients, the joint and skin lesions required independent treatment. There was little to confirm the suggestion that the arthritis will subside with adequate treatment of the skin. Contrary to some reports, psoriasis was not usually resistant to treatment. Most patients were treated with full dithranol, tar bath, and ultraviolet-light regimen.

Nail changes were resistant to treatment by local applications. Severe changes were treated with radiotherapy. The lesions resolved only to quickly recur. In no patients whose nails were treated by radiotherapy did the arthritis of the distal joints remit at the same time.

Often the arthritis was sufficiently mild to require no treatment. When treatment was employed, conservative management was effective. Steroids were employed in a few with short-term improvement in the majority. Chrysotherapy was given to 48 patients with psoriatic arthritis, with no more frequent occurrence of toxicity than in 42 patients with rheumatoid arthritis treated with gold. (Wright, V., Psoriatic Arthritis: A. M. A. Arch. Dermat., 80: 27-35, July 1959)

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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Amenorrhea—Sign of Chronic Liver Disease

Chronic liver disease as a cause of amenorrhea receives little recognition in standard textbooks of gynecology. The probable explanation is that in most cases of chronic liverdisease other manifestations such as jaundice or ascites are so prominent that amenorrhea is, by comparison, a trivial complaint. In some cases, however, amenorrhea is the presenting complaint and may bring the patient to the attention of the gynecologist who may not seriously consider chronic liver disease in differential diagnosis.

In infectious hepatitis, a common occurrence during the disease is the development of complete amenorrhea which may persist for many months. Return to a normal menstrual cycle may be the sign of recovery of liver function. Modifications of the menstrual cycle have been reported by many as a concurrent part of the history of various types of chronic liver disease.

In most reports, the presence of liver disease has been apparent on clinical examination of the patients, although in others the liver disease remains obscure. One observer described the history of a 19-year old girl who presented with amenorrhea 3 years after an attack of infectious hepatitis, and who was found to have chronic hepatic cirrhosis. In this case, administration of estrogen produced severe jaundice.

The authors reviewed 18 cases of amenorrhea associated with chronic liver disease, finding a mixed etiology for the liver abnormalities. Infectious hepatitis was the most frequent responsible factor with alcoholism and "lupoid hepatitis" being other factors.

Why amenorrhea develops in these patients is not clear. An apparent relationship between estrogen and severity of the liver disorder has been suggested. Results of study have indicated that estrogens affect the turnover of phospholipids in the liver and the division and development of liver cells. Estrolipoprotein synthesis occurs in the liver and this reserve of free estrogen may be affected in chronic liver disease without alteration in the amount of estrogen produced, for the excretion of estrogens and gonadotropins is apparently low in this clinical state. Thus, no explanation can be offered that satisfactorily accounts for the amenorrhea in apparently related conditions.

In all cases reported by the authors, flocculation screening tests for the presence of liver diseases were strongly positive, so that even in the few cases where liver disease was not obvious, if suspicion had been awakened, these tests would have strongly suggested the probable role of liver disease in production of the amenorrhea. (Green, P., Rubin, L., Amenorrhea as a Manifestation of Chronic Liver Disease: Am. J. Obst. & Gynec., 78: 141-145, July 1959)

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Significance of Early Treatment of Breast Cancer

Since 1948, the American Cancer Society, Inc., and other educational and public health agencies have worked to promote early detection and early treatment of cancer. With respect to the breast, for instance, both patients and physicians have been urged to seek out the small asymptomatic nodules and to have those that are suspicious removed.

If this program of education has been effective, it will have resulted in tangible changes in the population of women being treated for breast cancer. Both the emphasis on placing breast cancer symptoms before the physician and the emphasis on the dangers of long periods of "observing" suspicious lesions will have acted to lessen reported intervals between the detection and treatment of breast cancer. The campaign for periodic examinations of supposedly normal breasts by patients and their physicians will have resulted in discovery of more cancers while they were small. This in turn will mean that even with a given amount of patient-physician delay, cancers treated by surgery would have been smaller in size. By both mechanisms the average patient prognosis would be better in the present decade than it was in the early part of the last decade.

To study these points, the data on breast cancers seen at Memorial Center for Cancer and Allied Diseases, and Cornell University Medical College during 1950-1955 inclusive were compared with the data previously published on cancers seen in the years 1940-1943. The delays reported by the patients were tabulated and some improvement was noted in the later period. The size of cancers found at operation and the frequency and distribution of node metastases during the two time periods also were compared. These figures showed a significant improvement. The patients of the 1950's had smaller cancers with fewer node metastases, and, when present, metastases were located lower in the axilla. All these findings are consistent with the hypothesis that education of the public and physician have been of some use. At the same time, the fact that many women still report long delays between awareness of the tumor and definitive treatment, and the fact that many large cancers of the breast are still being seen indicate how much work remains to be done.

The same conclusion reached by the authors, that earlier cases of breast cancer are being seen in more recent years, can be drawn from other series. The operability rate has risen and the fraction of patients with operable cancer and without node metastases has risen. Perhaps the main contribution of the figures is to establish that to date more has been gained by promoting search for asymptomatic lesions than by the drive for less delay in treatment. Probably this could have been predicted. Delay, especially by patients themselves is related to emotional factors as well as to knowledge. In addition perhaps it is easier to persuade physicians to look for more lesions to treat than to induce them to change their methods of handling the disease they find.

Finally, these figures should suggest caution to those who would see every change in cancer cure rates as triumph for a new technique of treatment. There are many ways in which prognosis for a group of patients can be changed by 5 or 10%. The only way to prove that the noted improvement has been caused by treatment is to make sure that cases are matched in all other ways. In breast cancer patients, age, tumor size, and degree of node involvement would seem to be the minimum characteristics to be matched. Because most series do not contain this information, much of their possible significance is lost. (Robbins, G. F., et al., The Significance of Early Treatment of Breast Cancer: Cancer, 12: 688-692, July-August 1959)

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The Effect of Vaccine on Cancer Patients

Cancer vaccines have been given in an effort to bolster the patient's resistance to cancer. This employment is based upon the hypothesis that some part of the tumor is antigenically different from the host and that host resistance is important in human cancer.

Interest in the immune treatment of cancer was aroused by Jensen who observed that a transplantable mouse carcinoma could be caused to regress and disappear if treated with an immune rabbit serum. Other work, with variations and modifications, followed with the discovery of some encouraging features.

Animals can be readily immunized against subsequent implants of transplantable tumors, but there are no experiments in which an established tumor is consistently and successfully treated by vaccine. This failure is due in part to the rapid course run by most transplantable and spontaneous tumors in animals. Two weaknesses have plagued human experiments and, to a large extent, the animal experiments as well: There has been no measurement except clinical course, which is notoriously difficult to evaluate; and, the vaccine in each case has been either whole tumor, a fraction, or a product of the tumor, all of which are presumably found in the cancer patient and have been incapable of spontaneously eliciting the desired response. Therefore, a more antigenic preparation of the tumor must be used, or the patient must be changed so that he is more reactive. The present study pursued the former method introducing adjuvants with the tumor antigen.

An adjuvant is an agent that aids the antigen to elicit a more vigorous immune response. If a destructive immunity can be elicited and directed against normal tissues, it seems reasonable to assume that a similar and more vigorous response could be produced against a cancer which already shows some evidence of antigenicity.

Experience with well-known infectious diseases has shown that the most effective immunization is conferred by the introduction of the living unattenuated organism: the attenuated organism is somewhat less effective, and the killed organism or its products is only active in certain instances. These observations have influenced the approach to tumor vaccines.

A whole tumor preparation in a vaccine has the advantage of containing all ingredients, and it is hoped the body will develop the maximum immune response toward the elements that are most different from those of the host. For the current study, the authors employed various fractions of whole tumor preparation combined with Freund's adjuvant.

During the course of treatment and observation, 101 patients with advanced cancer were followed for 7 to 30 months. Gynecologic cancer formed the bulk of the material. Of the 101 patients, 55% lived longer than 7 months with many being observed as long as 3 years. Fourteen percent, apparently free of disease, were living at the time of the report, more than 3 years after treatment. Nothing was observed to suggest that the vaccine contributed to the patient's death or progression of the disease.

It was the impression of the authors that some of the patients had been benefited by the vaccine. It appeared to exert an effect potentiating radiotherapy. An unexpected feature of the study was the difficulty experienced in obtaining sufficient tumor for preparation of the vaccine. In only a minority was the cancer found in large enough masses to provide 5 gm. of relatively pure tumor. (Graham, J. B., Graham, R. M., The Effect of Vaccine on Cancer Patients: Surg. Gynec. & Obst., 109: 131-138, August 1959)

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Role of Salt and Renal Mass in Experimental Hypertension

The induction of high blood pressure by increased salt consumption has been reported in the rat, rabbit, and chicken. Some animals have developed severe renal disease associated with massive edema and a nephrotic syndrome. The experiments conducted by the author at the Institute of Pathology, Western Reserve University School of Medicine, were undertaken to (1) compare the effectiveness of salt and reduction in renal mass, individually and combined, in producing hypertensive vascular disease, and (2) clarify some aspects of the pathogenesis of both salt hypertension and renal-ablation hypertension.

Chronic hypertension was readily produced in the rat by excessive intake of salt. The high blood pressure was associated with development of diffuse vascular disease, nephrosclerosis, and cardiac hypertrophy and thus resembled human essential hypertension. The condition was usually terminated by intercurrent infection, uremia, or a combination of the two.

Salt was capable of inducing hypertension without any reduction in renal mass. However, the hypertensive effect was substantially enhanced by such reduction. Unilateral nephrectomy alone gave hypertension in only an occasional instance, but when this procedure was combined with increased salt intake hypertension occurred in practically every animal. There was an interesting dissociation between renal disease and high blood pressure among rats receiving unilateral nephrectomy and allowed only tap water, i. e., 56% developed nephrosclerosis of the remaining kidney and only 16% had hypertension. The reason for this is obscure and the result contrary to what was anticipated in view of the long-term nature of the study.

The etiology and pathogenesis of human nephrosclerosis have not been established. It is commonly held that the renal disease rests primarily on a vascular basis—arteriolar sclerosis—but if so the cause of the sclerosis is unknown. On the supposition that vascular disease is primary, the glomerular lesions have been attributed to ischemia, although thickening of the basement membrane of the capillary tufts constitutes a very early change. Evidence for infection as a causative factor is lacking. The role of hypertension in the induction of the vascular and glomerular changes still is not clearly defined.

More is known about the pathogenesis of rat nephrosclerosis, especially in connection with salt hypertension. From studies in the author's laboratory it appears likely that high blood pressure precedes significant morphologic damage to the kidney. However, hypertension per se is not considered to play the main role in initiating either the glomerular or the vascular change. The early stage of glomerular disease may precede or develop simultaneously with arteriolar lesions. Later, as the glomerular damage becomes diffuse, the vascular disease appears inadequate in distribution and severity to account for it. The evidence suggests that both the glomerular and the vascular lesions in rats with salt hypertension result from the injurious effect of the salt itself.

Previous work revealed that a reduction in kidney substance is well tolerated initially, with eventual collapse under the strain of a continual functional overload. Most vulnerable to the excess work load are the glomeruli. Evidently the excretion of end-products of protein metabolism and other substances is harmful.

The author's present study provides convincing evidence that prolonged high salt intake also has a deleterious effect on the kidney and promotes the development of nephrosclerosis. The renal damage from salt is readily obtained in intact animals and does not depend on reduction in renal mass. However, injury to the kidney is clearly augmented when fewer nephrons are available for function.

It is important to emphasize that focal lesions of early nephrosclerotic type often occur spontaneously in the rat, the origin being obscure. An active role of salt in this process seems to be a distinct possibility. Other dietary constituents also might be implicated.

In the author's opinion, no satisfactory evidence exists to prove that reduction of kidney mass, such as three-fourths ablation, results in the release of a pressor substance by the remaining kidney tissue, producing hypertension. His interpretation of completed studies suggest a different basis. Observing the progressive increase of frequency of hypertension with increasing loss of renal substance while on a high salt intake, it seems important that the greater the degree of renal ablation the more responsive the animal becomes to the hypertensive action of salt. According to this concept the hypertension following subtotal nephrectomy is mediated by the toxic effect of salt, presumably without elaboration of a renal pressor substance, although there is no evidence for the absolute exclusion of the latter.

From the studies in the author's laboratory there appears to be a fairly well defined pattern of events in the induction of hypertensive vascular disease by salt. The primary injury is to the peripheral blood vessels and the initial effect is evidently functional and consists of increased vascular tonus. This gives rise to hypertension, which thus represents a very early sign, perhaps the earliest, of widespread peripheral vascular involvement. At the time hypertension is initiated, the blood vessels are either morphologically unaltered or show only sparse and relatively slight lesions. The high blood pressure is accompanied after a variable interval by progressive diffuse structural damage to arteries and arterioles in such sites as pancreas, mesentery, adrenals, gastrointestinal tract, and kidneys. The kidney lesions, especially those in the blood vessels, develop more or less simultaneously with those of the other peripheral vessels and are regarded as the renal component of the generalized vascular disease. Therefore the usual sequence in salt-induced hypertensive vascular disease is (1) increased tonus of peripheral vessels, (2) hypertension, (3) generalized vascular lesions, and, (4) nephrosclerosis. While the precise manner in which the vascular injury arises is not clear, it may be related to electrolyte imbalances in the blood vessels initiated by retention of sodium and its subsequent accumulation within the vascular wall. There is some evidence that hypertension itself is not responsible for the vascular lesions.

While kidneys do not play the primary role in initiating salt hypertension, they have an ancillary one related to their capacity to deal with salt and perhaps water. Maintenance of electrolyte equilibrium within the body is an important aspect of renal function.

The critical item in salt hypertension is of course its relation to human essential hypertension. That the latter is influenced by salt seems

certain from available data, and the possibility of a pathogenetic relationship cannot be excluded. From the pathologic standpoint there is much resemblance between the lesions of salt hypertension in the rat—diffuse vascular disease, nephrosclerosis, and cardiac involvement—and those of human essential hypertension. Over all, salt hypertension is much more like the human disease than is any other form of experimental hypertension. Thus there is a reasonable basis for the supposition that salt is an etiologic agent in essential hypertension in man. (Koletsky, S., Role of Salt and Renal Mass in Experimental Hypertension: A. M. A. Arch. Path., 68: 11-22, July 1959)

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Association of Military Surgeons Annual Convention

The 66th Annual Convention of the Association of Military Surgeons will be held at the Mayflower Hotel, Washington, D. C., 9-11 November 1959. Approximately 2,000 American and international physicians, dentists, veterinarians, nurses, and medical specialist delegates will assemble for the series of meetings.

Under the overall direction of the U. S. Air Force this year, the general chairman is COL Aubrey L. Jennings USAF MC, commander of the hospital at Andrews Air Force Base, with COL Frank M. Townsend USAF MC, the recently appointed director of the Armed Forces Institute of Pathology, as chairman of the scientific program committee. Major General Harold H. Twitchell USAF MC, President of the Association, has designated "Practice of Military Medicine—Broadening Concepts" as the theme for the meeting, and will present the opening address. The Navy Medical Department is represented by officers serving as members of various committees.

The features of the Monday afternoon session, 9 November, include a lecture by Dr. Austin M. Smith, President of the Pharmaceutical Manufacturers Association. Dr. Robert M. Chanock will speak on "Knowledge of Newer Respiratory Viruses," Dr. William J. Brown will present a paper on "Present and Future Problems in VD Control," and LT COL William H. Crosby MC USA, will discuss "The Danger of Folic Acid In Multivitamine Preparation."

The following morning the session will begin with the Porter Lecture on Trends in Mental Health by Dr. Paul H. Hoch, Commissioner of the Department of Mental Health for the State of New York, Dr. R. W. Postlethwait will present "Gurrent Trends in the Indications for Surgery in Peptic Ulcer" and Dr. John M. Rumball will discuss "Changing Concepts of Nutrition Following Subtotal Gastrectomy."

On Tuesday and Wednesday afternoons, a closed circuit color television program originating from Andrews Air Force Base, Washington, D. C., will be shown, and will include presentations from the following: Air Force Clinic at the USAF Hospital, Andrews Air Force Base; USAF Epidemiological Laboratory; USAF School of Aviation Medicine; Armed Forces Institute of Pathology; Cape Canaveral; Air Force Missile Development Center; Bureau of Medicine and Surgery, Department of the Navy; Arctic Aeromedical Laboratory; and Aero Medical Laboratory, Wright Air Development Center.

The program for Wednesday morning, 11 November, includes: "The Tissue Bank" by CAPT George W. Hyatt MC USN; "Medical and Surgical Aspects of Open Cardiac Surgery" by Brigadier General Clinton S. Lyter MC USA; "Selective Malfunctioning of the Human Machine" by LT COL Douglas Lindsey MC USA; "Three Years Experience with Intensive Treatment and Recovery Unit in Medicine and Surgery" by CAPT Lewis L. Haynes MC USN; "The Use of Radioisotopes in Medical Practice" by CAPT E. R. King MC USN; "The Use of Fluorescent Antibody Technics in Hospital Practice" by Dr. Ralph B. Hogan; "Drug Therapy in Hypertension" by Dr. Edward D. Fries; and "The Use and Abuse of Drugs" by Dr. Arthur Grollman.

During the three-day meeting there will be special section meetings with panel discussions for dentists, veterinarians, nurses, and medical specialists. Films on medical and scientific subjects will be shown continuously and approximately 60 technical and 12 scientific exhibits have been prepared.

Reserve officers attending the meeting will receive one retirement point for each day of attendance providing registration is made with the military representative present on each day of attendance.

Registration for the meeting will be made after 1300 on Sunday, 8 November 1959. No registration fee is required.

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Examination, Part I
American Board of Obstetrics and Gynecology

The next scheduled examination, (Part I), written, and review of case histories for all candidates will be held in various cities of the United States, Canada, and military centers outside the Continental United States, on Friday, 15 January 1960. Candidates must submit case reports to the office of the Secretary within thirty (30) days of being notified of their eligibility to Part I. Current Bulletins may be obtained by writing to:

Robert L. Faulkner, M. D.
Executive Secretary and Treasurer
2105 Adelbert Road
Cleveland 6, Ohio

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Applications for Training in Civilian Institutions

In view of the need for early commitment with civilian institutions for training programs to begin in the Summer and Fall of 1960, interested medical officers are urged to submit their requests to the Chief, Bureau of Medicine and Surgery prior to 30 September 1959. The types of Training Programs available are:

1. Neurological Surgery—Completion of 1 year General Surgery required.
2. Thoracic Surgery—Certification by American Board of Surgery required.
3. Plastic Surgery—Completion of three or preferably four years of General Surgery required.
4. Aviation Medicine (1 year for Master's Degree in Public Health)
5. Occupational Medicine
6. Public Health
7. Radiobiology
8. Subspecialties of Internal Medicine (Gastroenterology, Hematology, Allergy and Pulmonary Disease)—Completion, Part I, American Board of Internal Medicine, required.

Individuals may indicate 3 choices of institutions in the order of preference as to where they desire the training. However, the Bureau of Medicine and Surgery will make the final arrangements for enrollment, after Bureau approval of the request has been obtained. Applicants may contact institutions relative to training but, in any correspondence or interviews, it should be made clear that any acceptance would be contingent upon approval being obtained from the Bureau of Medicine and Surgery.

Applications from career medical officers qualified to enter these programs should be made by official letter to Chief, BuMed, via chain of command, and should include the obligated service agreement stipulated in BUMED INSTRUCTION 1520.7B. Only a limited number of individuals will be sponsored in such programs in view of the existent personnel shortage.

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From the Note Book

Medical Annals. The July issue of the "Medical Annals of the District of Columbia," a monthly publication of The Medical Society of The District of Columbia, was the National Naval Medical Center Number, with all professional articles being contributed by members of the staff of the Naval Hospital at the Center. Subjects discussed by members of various departments of the hospital included: staphylococcal pneumonia, fibrinogen, cardiac arrest and resuscitation, deafness, external otitis, bicipital tenosynovitis, and torsion of the fallopian tube.

USNH Great Lakes. The U. S. Naval Hospital, Great Lakes, Illinois has been approved for three full years of training in Internal Medicine. Previously, only two years of training in that specialty had been approved for that hospital.

A. P. A. Meeting. CAPT Leo J. Elsasser MSC USN, Director, Medical Service Corps Division, was the Surgeon General's representative to the House of Delegates of the American Pharmaceutical Association during their recent meeting in Cincinnati. LCDR Solomon C. Pflag MSC USN, Head, Pharmacy Section, Professional Division of the Bureau, acted as the Bureau's professional representative. During the course of the meetings, LCDR Pflag presided over the section on Military Pharmacy of which he is chairman.

Military Entomology. A two week course in military entomology, dedicated to military entomologists who were killed during World War II, was presented by the Armed Forces Pest Control Board at the U. S. Naval Medical School, Bethesda, Md., beginning 3 August 1959. The course, designed to acquaint entomologists within and outside the Armed Forces with the problems, techniques, goals, and philosophy of military entomology, was attended by 10 civilians and 26 Armed Forces officers—11 Navy, 10 Army, and 5 Air Force.

NC Indoctrination Course. In response to the request of the Surgeon General that indoctrination of Nurse Corps officers be aligned with that of other women officers in the Navy, the Chief of Naval Personnel has established an 8-week indoctrination course for Nurse Corps officers at the U. S. Naval School, Officer, (Women), within the Naval Schools Command, Newport, Rhode Island.

The course of instruction is planned to aid the newly-commissioned Nurse Corps officer in adjusting to military life and acquainting her with her responsibilities and privileges as an officer. Appropriate theoretical background concerning the Navy Medical Department is provided, but no practical experience in a naval hospital will be given.

On 1 July 1959 the first group—53 Navy Nurse Corps Candidates—reported for the indoctrination course.

Laennec's Cirrhosis. The authors studied 73 patients with Laennec's cirrhosis and observed that in patients with a normal range of blood ammonia, dietary regimen influenced neither clinical picture nor ammonia levels. In patients with high blood ammonia levels but without neurologic signs, a low protein diet appreciably decreased the ammonia level and increased the survival rate. Patients with neurologic manifestations and high blood ammonia levels also fared better. When glutamic acid was used as a supplement either orally or intravenously, ammonia levels dropped more

rapidly than when patients were on a low protein diet alone. High blood ammonia levels were clinically significant both as therapeutic guide and prognostic aid, whereas normal blood ammonia levels had no such significance. Arterial blood gives the most accurate levels as muscle tissue can remove up to 50% of ammonia passing through it, thereby lowering venous levels. (N. W. Chaikin and M. S. Loningsberg, Gastroenterology, June 1959)

Pulmonary Disease and Ulcer. Noting the apparent increased frequency of gastroduodenal ulceration among patients with chronic pulmonary disease in a hospital located in the heart of a coal mining area, the authors compiled results of their experiences. In the group there was an incidence of 25.6% with a preponderance of the older age male. The atypical nature of the symptoms was stressed without apparent correlation of the incidence of ulcer disease with the severity of pulmonary disease. It was suggested that when anemia occurred with chronic pulmonary disease, a bleeding peptic ulcer should be expected. (W. O. West, et al, Arch. Int. Med., June 1959)

Breast Cancer. Adrenalectomy in advanced breast cancer was reviewed by Block et al at the University of Michigan, and included their own series of 27 patients. They showed that a random selection of patients will produce remissions in over 40%, being a reflection of chance association of patients who have hormonally sensitive tumors and whose internal endocrine environment is conducive to sustenance of these sensitive tumors. By careful selection of patients a remission rate almost double that of random selection can be achieved. Stressing that this form of treatment is one of palliation, with Addison's disease added to a possibly advancing lethal neoplasm, the following criteria were urged as a basis for employment of adrenalectomy: (1) no involvement of liver; (2) previous remission from oophorectomy; (3) high estrogen excretion; (4) age between 50 and 60 years; (5) prolongation of disease, usually over three years. (Surg. Gynec. & Obst., June 1959)

Tolbutamide. Although effecting good control in more than half of the patients receiving it, tolbutamide exhibits the phenomenon of a subsequent loss of effect—secondary failure—which has been reported in 0.3 to 14% of all patients. Of the 200 patients of this report, 16% showed secondary failure, developing at unpredictable times. None exhibited significant toxic effects. Their data confirmed previous reports that best results can be anticipated in the nonketotic, asymptomatic diabetic patient who is of near-normal weight, over 40 years of age, and takes less than 40 units of insulin per day. (J. M. Moss, et al, Ann. Int. Med., June 1959)

Magnesium and Labor. Incident to use of intravenous magnesium sulfate in treatment of toxemia of pregnancy, prolongation of labor has been observed. Assessing the role of the magnesium ion, the authors found that it inhibited contractility of isolated gravid human uterine muscle; and in clinical experience, did have a depressant action on uterine motility, although this effect did not detract from its use as the anticonvulsant of choice in toxemia of pregnancy. (D. G. Hall, et al, Am. J. Obst. & Gynec., July 1959)

Delirium Tremens. This study was designed to re-examine the rationale of treatment of delirium tremens—a combination of physiologic disturbance and emotional stress in an individual whose relation to reality is tenuous. The initiating mental event is "pharmacothymic crisis," and the physiological disturbance consists of one or more of the following: dehydration; low serum magnesium; low salt syndrome; brain swelling. An inability to respond to stress is evident, and, owing to chronic vitamin deficiency, the alcoholic is found unable to respond with formation of mineralcorticoids. (H. Krystal, Am. J. Psychiat., August 1959)

Retrobulbar Neuritis in P. A. Presenting symptoms of pernicious anemia may be ocular with failing vision and blindspot. The pathologic process may be similar to subacute combined sclerosis occurring in the columns of the cord. Prognosis is good if adequate treatment is initiated early. (P. Ellis, et al, Am. J. Ophth., July 1959)

Bovine Bone Graft. Bovine bone marrow paste, and mandible and solid implants preserved in sterile bovine plasma was used in reconstructive surgery about the face. (N. Georgiade, Plast. & Reconstruct. Surg., July 1959)

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Policy

The U. S. Navy Medical News Letter, is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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DENTAL SECTION

Corn Yields Tooth Clue

A 10-year old discovery that Texas has something New England lacks has revealed a significant new approach to the prevention of tooth decay—the use of phosphorus.

Dr. Robert S. Harris of the Massachusetts Institute of Technology, who made the discovery, found that hamsters fed on Texas corn and milk developed 40% less dental decay than those raised on the New England foods.

After a long series of experiments with the animals, Dr. Harris concluded that the anti-decay factor was phosphorus—a simple abundant chemical. He has achieved 100% effectiveness in decay prevention among hamsters given four times the amount of phosphorus naturally present in the Texas foods. In addition, he told Science Service "the teeth grew in pearly white, and were lustrous and better shaped."

A Swedish dentist, Dr. Allen Stralfors of the Royal Dental Institute at Malmo, has obtained a 50% reduction in decay in the first human trial on 2,000 children. The first United States trial is soon to begin among Indian children in South Dakota.

Dr. Harris, 54-year old biochemist, is presently working under a Naval Research Laboratory grant assisted by A. E. Nizel, D. D. S. After his initial discovery of the potency of the Texas-produced corn and milk, Dr. Harris took these steps:

He burned the food, collected the ash, and added the ash to more food. Hamsters on this "reinforced" diet were almost entirely free of tooth decay.

Dr. Harris then analyzed the ash, finding a number of chemicals, including phosphorus. He made a synthetic ash with the same chemicals and obtained the same results with hamsters. By leaving certain substances out of the synthetic ash, he narrowed the anti-decay factor down to phosphorus.

Trying various phosphorus-containing compounds in differing amounts, best results were attained with metaphosphoric acid in four times the amount present in the Texas foods. (Science News Letter, 75, July 18, 1959)

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Dental Care - Fiscal Year 1959

During Fiscal Year 1959, 7,285,409 dental procedures were performed by an average of 1,608 dental officers. Operative dentistry—fillings, crown, and bridge work—accounted for 2,998,258 procedures. In prosthodontics, 13,495 full dentures and 37,385 partial dentures were completed. Extractions amounted to 350,250 teeth, and 1,602,325 dental x-rays were taken. Among other procedures were 235,453 prophylactic treatments, 204,431 scaling (periodontal) operations, and 15,592 caries prevention treatments.

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Revised Prosthetic Handbook for Technicians

A fully revised Technician Prosthetic Handbook is now available. The new handbook was prepared for use as a classroom text, as reference material for correspondence courses, and guide for nonsupervised laboratory procedures.

The handbook was prepared by the staff of the Naval Dental School under authority of the Dental Division, Bureau of Medicine and Surgery. A correspondence course using this handbook will soon be available.

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RESERVE SECTION

Retention Beyond Age 60 Limited by Ruling

Under present law, Reserve officers on inactive duty who are qualified for retirement with pay at age 60 may be retained in an active status beyond age 60 only under specific orders of the Secretary of the Navy.

A recent decision by the Comptroller General has made it necessary to enforce this requirement in order to protect Reservists who are retained past this age. As a result of this decision, officers who are qualified for retirement with pay at age 60 are not eligible to earn additional credits toward retirement after they reach age 60 unless thay are retained in an active status under SecNav orders. The current policy with regard to retention and retirement is as follows:

Inactive duty Reserve officers—other than flag and general officers—who are qualified for retirement with pay upon reaching age 60 shall be given

an opportunity to retire, as provided by law. However, if they fail to retire, they shall be discharged. For example, if an officer qualifies for retirement with pay on 15 June 1960 and reaches age 60 on 12 August 1960, he would be required to retire as of 1 September 1960 or be discharged.

All other officers shall be retired or discharged on the earliest of the following dates:

1. Upon reaching age 60, the first of the month following the date on which they first complete their qualifications for retirement with pay. Thus, if an officer reaches age 60 on 15 June 1960 and qualifies for retirement with pay on 12 August 1960, he would be required to retire on 1 September 1960. Failure to retire would result in discharge.

2. The first of the month following their 62nd birthday if retained, with their consent, beyond age 60 under orders of the Secretary of the Navy. This category includes officers assigned to essential, hard-to-fill mobilization billets and who are, therefore, retained in an active status by SecNav.

3. The first of the month following their 62nd birthday if they cannot qualify for retirement with pay on or before their 64th birthday, or if they were commissioned after 1 January 1953.

Flag officers—with their consent—may be retained in an active duty status until age 62 upon orders of SecNav. The law also permits SecNav to retain, with their consent, a maximum of 10 flag and general officers in an active status until age 64.

No officer may be retained in an active status after he reaches age 64.

This policy will be incorporated in the BuPers Manual; details will be announced by BuPers Notice. (The Naval Reservist, June 1959)

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How to Accelerate AcDuTra Pay

For those reporting for annual active duty for training, some suggestions follow for accelerating payment of AcDuTra pay and allowances.

Basic Allowance for Quarters (BAQ). Much time and trouble will be saved if substantiating documents for BAQ are completed and certified before reporting for AcDuTra.

Dependency Certificate. Officers must file Dependency Certificate—Wife or Child under 21 Years, DD Form 137, or NavComp Form 2040, whichever is available. Dependency Certificate—Mother and/or Father, NavCompt Form 2040-1, is required when appropriate. Enlisted Reservists must file Application for Dependents Allowance, NavPers Form 668.

Failure to have these forms completed and ready for submission when requested will hinder or delay payment. When possible, forms should be obtained and completed at the Naval Reserve Training Center.

Copies of Orders. Reservists sometimes lack the proper number of certified copies of orders, have incomplete orders, or fail to have necessary

endorsements. All personnel are required to have the original and eight certified copies of orders complete with all endorsements, including signature of the Reservist acknowledging receipt of orders, in their possession when reporting for AcDuTra. No copies of orders are to be detached unless more than the minimum number required are received. If fewer than the required number are submitted, the orders may be returned by the disbursing officer for preparation of additional copies. Particular attention must be paid to insure that all possible endorsements are completed before orders are submitted to the disbursing office. (The Naval Reservist, May 1959)

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OCCUPATIONAL MEDICINE

Tetra-Ethyl Lead Poisoning

Recently, three Navy men working aboard ship suffered severe acute tetra-ethyl lead poisoning. These men worked 6 or 7 hours in a closed space which contained a leaking gasoline pump. All three became comatose. Two of the men are making a satisfactory recovery, but the condition of the third is still critical. In view of the foregoing, the subject of tetra-ethyl lead poisoning seems appropriate to review.

Lead poisoning may occur in industry in two forms: (1) from exposure to the inorganic compounds of lead, and (2) from handling organic compounds, especially tetra-ethyl lead. The clinical picture is different in the two forms. Poisoning by the inorganic compounds causes colic, wrist drop, stippling of the red blood cells and anemia. In poisoning by tetra-ethyl lead the picture is that of insomnia, mental confusion, delirium, and mania.

Tetra-ethyl lead is an organic lipoid soluble compound readily absorbed through the skin and respiratory tract. It is a clear, heavy, oily liquid with peculiar sweetish odor, is somewhat volatile at ordinary temperatures, and is added to gasoline as an antidetonant.

In 1923, when tetra-ethyl lead was first manufactured in the United States, 149 cases of encephalopathy occurred in men employed at three separate plants. Within 17 months, 11 deaths were reported. Those affected suffered from restlessness, talkativeness, ataxia, insomnia, and delusions. There were no paralyses or convulsions, but the condition terminated with violent mania, shouting, leaping from bed and smashing of furniture. By attention to plant design, further catastrophies of this sort were avoided. Apprehension as to possibility of poisoning of garage and aircraft workers by lead from exhaust gases of gasoline has proved to be without foundation.

During World War II, a new hazard arose in the process of cleaning storage tanks which had contained ethyl-gasoline. After the gasoline had been

pumped out and the air rendered gas-free by ventilation, floors, walls, and supporting pillars were scraped clean. Men engaged in the work were required to wear an air-line mask and were supplied with a complete outfit of clothing including boots, gloves, and headgear. The protection afforded was satisfactory, but there were occasional instances of failure to obey the regulations with the result that 25 cases of poisoning by tetra-ethyl lead occurred, two of them fatal (Cassells and Dodds, 1946). War conditions in the countries of the Middle East and Far East made cleaning the tanks difficult to supervise, and there were 200 cases of poisoning with 40 deaths. Unhappily, many of these cases were not recognized soon enough.

Early symptoms include insomnia, loss of weight, anorexia, and morning nausea. Mental manifestations dominate the clinical picture, and in severe cases restlessness, bad dreams, hallucinations, and delusions are common. Several symptom-complexes have been distinguished—delirious, manic confused, and schizophrenic (Machle, 1935). With severe exposure there may be abrupt onset of acute maniacal symptoms with suicidal tendencies or the occurrence of convulsions. Less severe cases begin with insomnia—sleep being difficult, broken, and restless, sometimes with wild and terrifying dreams. By day, mental excitement may be marked, headache is usual and often severe, and vertigo is frequent. Blurred vision and diplopia owing to weakness of extrinsic ocular muscles are occasional complaints. Evidences of meningeal irritation are absent; the cerebrospinal fluid at times may be under increased pressure, but is not otherwise abnormal.

Punctate basophilia is absent or slight and the test for its presence in blood, therefore, has little significance. Anorexia, nausea, and vomiting are constant; colic does not occur, but diarrhea sometimes develops. Many patients complain of a metallic taste in the mouth. Weakness, tremor, muscular pains and ease of fatigue are frequent complaints. The tremors affect the extremities, lips, and tongue, are coarse and jerky, and aggravated both by effort and by attempts at control. In patients who recover, all symptoms disappear in 6 to 10 weeks. Occasionally, an anxiety state persists for a time.

In 1947, Bini and Bollea described two fatal cases of poisoning where ethyl-gasoline intended for use as aviation fuel was used for the dry cleaning of clothes. The patients were Italians, a man of 20 and a woman of 30, who cleaned and pressed the uniforms of American airmen stationed in Italy. They worked in a room which was small, closed, and poorly ventilated, and ironed clothes still wet with the leaded gasoline. After a few days' exposure they suffered from anorexia, vertigo, general weakness, and insomnia. About a week later there developed psychomotor agitation with a rapid stream of disconnected speech and mental confusion. This state took the form of a toxic confusional delirium accompanied by visual and auditory hallucinations occurring together, tremors affecting all muscles, myoclonus, and choreiform movements. Two days later they became comatose and died with a temperature of 105° F. At necropsy both cases showed the brain to have diffuse

hyperemia of the cortical grey matter and basal ganglia. Histologically, there were both diffuse and focal changes. Throughout the cerebral and cerebellar cortex there were diffuse acute degenerative changes in almost all nerve cells. In places, groups of nerve cells showed severe degenerative changes with complete disintegration of cell bodies. Focal lesions were found, especially in the mamillary bodies and to a lesser degree in the floor of the fourth ventricle and in the corpora quadrigemina. Nerve cells in the mamillary bodies appeared to be severely injured and in some areas had completely disappeared. In addition, there was intense proliferation of the glia with predominance of microglia cells. Where this occurred, there was also new formation of capillaries and perivascular infiltrations with small round cells including mast cells.

In mild cases removal from exposure, a normal diet with extra fluids and the relief of insomnia by the proper choice of barbiturates are all that is required. Severe cases call for strict supervision and skilled nursing because of hallucinations and impulsive suicidal tendencies. Morphine is contraindicated; the sedative action of repeated doses of barbiturates together with adequate fluid intake being the essentials of treatment (Kehoe, 1953). Pentobarbitone sodium may be given in repeated full doses to obtain rest. Glucose, 5% in saline, may be given intravenously up to 3 liters a day, and if given as a drip, hexobarbitone may be added. Machle (1935) recommends the intravenous administration of from 2 to 4 gm. of magnesium sulphate in 2% aqueous solution accompanied by doses of pentobarbitone sodium up to 1 gm. daily by mouth. Cassells and Dodds (1946) found that enemas of 180 ml. of a saturated solution of magnesium sulphate often had a sedative effect when they could be retained. (The use of EDTA should be considered in severe cases.)

Preventive measures include strict regulations for cleaning tanks which have contained leaded gasoline. Such work should be done under proper supervision and by trained men properly equipped with protective clothing and breathing apparatus. Although ethyl-gasoline contains less than one part in a thousand of tetra-ethyl lead, it should not be used for cleaning the skin. Leaded gasoline mists must not be inhaled. The tragic events that follow inhalation of leaded gasoline mists were described in the incident of the Italian dry cleaners. (Excerpt from text: The Diseases of Occupations; Donald Hunter, M. D., F. R. C. P.)

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EDTA Therapy in Excessive Lead Absorption

Excessive lead absorption by persons in industry may occur as a result of one or more of the following circumstances: inadequacies or failures of existing measures for control of processes in which lead or lead compounds are used; poor personal hygiene; individual or group carelessness or indifference; unrecognized sources of exposure to lead; and, accidental exposure to

readily absorbed lead compounds such as tetra-ethyl lead. Since the previous Lead Hygiene Conference, held in 1948, many fascinating contributions have been made in therapeutics. Notable among them were the introduction and use of EDTA (ethylene diamine tetra acetic acid) and its salts.

Administration of EDTA or its mono- or disodium salts to the animal organisms results in the chelation and elimination of calcium. Because of this mechanism, it is not difficult to produce toxic manifestations with these agents. To avoid the possibility of producing a state of hypocalcemia, edathamil calcium-disodium is used. The administration of this compound in lieu of the acid or its mono- or disodium salts does not prevent the removal of lead from body fluids and, indirectly, the soft tissues, since it proceeds to replace the calcium in the ring because of the greater stability of the lead EDTA complex. The newly formed lead complex is highly soluble in water. Since the lead in the chelate is bound firmly and is no longer in an ionized state, it does not exert its characteristic toxic effects. It is apparent at this point that these properties of edathamil calcium-disodium meet some of the specifications for a suitable or ideal therapeutic agent of this type. The end product of such agents should have the following characteristics: it should be water soluble; it should be stable and not readily broken down by metabolic or other means within the body; it should be excreted rapidly; it should be readily absorbed and effective when administered orally; and, it should be relatively nontoxic when administered in effective amounts over prolonged periods of time. The latter includes the effects that might be induced by the depletion of trace metals that are necessary for the functioning of enzyme systems and other biologic mechanisms within the complex animal organism.

It has been demonstrated that edathamil calcium-disodium is quickly and widely dispersed throughout soft tissues and body fluids after intravenous or intramuscular administration—not being concentrated significantly in any organ. The compound does not appear to enter cellular components of the blood, and the level in spinal fluid is far below that found in plasma. After parenteral administration of the drug, excretion occurs rapidly, primarily via the kidneys. It was found that over 50% was eliminated from the body within the first hour, while 90% was removed within 7 hours. The absorption of the drug from the alimentary tract is delayed and relatively poor. Evidence of renal damage has been observed in humans and degenerative changes in the tubules of the kidneys have been produced in animals when relatively large doses were administered over prolonged periods of time.

The primary "deleading" action is apparently accomplished by removing the lead from plasma and other body fluids. Shortly after intravenous administration of a dose, levels of lead in the blood may rise without producing adverse effects. The lead level then falls as excretion of the complex proceeds. Subsequently, the lead content of blood may increase appreciably, and it may attain very nearly its original high level as the lead in the skeleton tends to come into equilibrium with the body fluids and indirectly with the soft tissues

of the body. Following administration of the chelating agent, the rate of lead excretion is increased greatly, soon reaches a peak, then tapers off somewhat as administration of the chelating agent is continued.

The recommended maximum dose for intravenous administration for each 10 lb. (4.5 kg.) of body weight is 0.17 gm. per hour, 0.33 gm. per day, or 1.67 gm. per week. The drug in a concentration not to exceed 3% should be given in normal saline or in a 5% dextrose solution. The maximum dose per course of treatment is 2.5 gm. for each 10 lb. of body weight. Courses should be separated by an interval of 7 days; it is inadvisable to exceed 2 courses until or unless analytical results demonstrate a clear need for further therapy. Such need exists when the concentration of lead in the blood fails to diminish satisfactorily, or fails to remain well below a dangerous concentration. All persons undergoing therapy should be checked frequently for evidence of renal damage.

EDTA and the Prophylaxis of Lead Intoxication. The routine, frequent, or infrequent use of edathamil calcium-disodium or other present or future drugs as prophylaxis against the absorption of excessive quantities of lead cannot be condoned. Prophylaxis can be achieved safely only by controlling the sources of exposure to lead by the application of proper measures of industrial hygiene. The attitude that this cannot be accomplished generally in industrial operations reflects unawareness of the true facts or unwillingness to correct unsafe conditions (there are exceptions which result from the brevity of certain operations or the occurrence of unusual or unforeseen conditions). In the occasional circumstance where this is not practicable, strict adherence to recognized and properly supervised personal protective measures, provision for adequate sanitary facilities, and insistence upon good personal hygiene and sound medical supervision of workers will prevent development of cases of lead intoxication.

Quite apart from the fundamental philosophy that prophylaxis should be attained by control of environment, there are other valid reasons for not employing edathamil calcium-disodium as a preventive measure.

1. The toxicologic potentials of the drug are not fully understood. The toxic effects observed in humans and animals from relatively short periods of administration have been mentioned; however, the effects that may be produced by administration to human beings of even low doses over prolonged periods are not known and are matters for conjecture.

2. Since this drug is absorbed poorly from the gastrointestinal tract, it is unlikely that the additional quantities of lead that may be eliminated by its use would be sufficient to prevent illness when compared with the total amounts of lead that are absorbed and retained during exposure to potentially hazardous conditions.

3. Administration of the drug may mask the symptomatology of mild or early lead intoxication, thereby preventing recognition of hazardous exposure before a more serious or prolonged illness is produced.

4. While under the effects of the drug and for variable periods thereafter, levels of lead concentration in the blood and urine are meaningless and may be misleading for diagnostic purposes.

5. Use of such agents, regardless of their efficacy, tends to lull those persons responsible for the health of workers into a false sense of security which, invariably, is accompanied by relaxation of recognized procedures and control measures. Such action leads to serious consequences for all concerned.

Edathamil Calcium-Disodium and Lead Intoxication. Objectives of therapy in all cases of lead intoxication are to treat the acute episode and to assist the individual to return to his optimum level of health in the shortest time possible. Paramount to both objectives is the immediate termination of exposure to lead. With edathamil calcium-disodium it is now possible to effect safely the elimination in shorter periods of time of appreciably greater quantities of lead than heretofore. While this is highly desirable, the extent to which this modifies the ultimate clinical course of the disease cannot be stated with certainty. Dramatic subjective improvement shortly after institution of treatment has been reported in cases of poisoning from inorganic lead. In other cases, however, symptoms have persisted and have necessitated employment of additional time-proved measures, such as administration of calcium gluconate intravenously for their relief. Other favorable responses, such as a sharp decrease in the numbers of "stippled" erythrocytes in the blood or concentration of coproporphyrin in the urine, have been reported frequently. Some claims of subjective imporvement in mild cases probably have been over enthusiastic because this occurs quite frequently soon after removal of the patient from exposure.

In conclusion, edathamil calcium-disodium is a drug that is capable of forming a chemically inert lead-complex which is rapidly eliminated from the body. At present, it is believed that the drug is most useful in the treatment of the acute phase of the illness. However, it is likely that its principle virtue lies in its ability to expedite the elimination of potentially toxic quantities of lead from the body. By this means, one may hope to shorten the period of disability or of unemployment of the industrial workman. The body of knowledge concerning its useful application in cases of intoxication from lead and other metals is growing steadily, and it is hoped that its true value in therapy of lead poisoning soon will be established. (Miller, L. H., EDTA Therapy in Persons with Excessive Lead Absorption from Industrial Exposure: Indust. Med., 28: 144-147, March 1959)

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Occupational Analysis of Coronary Disease Mortality

The question of whether management is more susceptible to death due to coronary heart disease than nonmanagement was a primary reason for a

mortality study based on male employees of a large private industry. The study covered a 5-year period. Deaths were classified as they occurred according to the International List of Causes of Death. The results of this study indicate that top management has the lowest rate of mortality due to coronary causes of all groups considered, although the rate for all management appeared to be higher than for nonmanagement.

A comparison of death rates from coronary causes and all causes showed a sharp rise in the proportion of coronary deaths from ages 26 to 40. At age 40 the ratio of coronary to total deaths leveled off, staying within the range of 30 to 40% through age 64. A slight decline appeared at the later ages.

Active employees from ages 40 through 64 were used for making comparisons between occupation groups. This group made up over 375,000 life years of exposure in the 5-year period from which 1,082 deaths from coronary causes resulted.

To make a comparison by occupation the employees were classified and divided into groups according to the type of work and responsibility involved. These groups were then combined into management and nonmanagement. The classification was somewhat arbitrary, but sufficiently accurate for the intended purpose.

Even though management appears to have the higher level of mortality there seems to be no consistency within the groups. The subdivisions of the management group which includes officials, supervisors, and staff, and foremen, could be considered roughly as top, middle, and lower management, respectively. The top management not only showed the lowest level of mortality for the management group, but for the entire group of employees. The mortality level of the middle management group goes up considerably from top management, but the level drops again for lower management.

A high mortality in the clerical group was to some extent caused by a transfer of physically impaired craftsmen into this group. The extent that this would affect the mortality level of this group is not known; however, assuming that the effect would not be great, it would appear possible that a different distribution of employees by occupation might change the results to show a higher mortality for nonmanagement than for management.

The rates of mortality from coronary causes for active employees, service pensioners, and the combination of active employees and service pensioners were reviewed. The high rates noted for service pensioners shows that retirements prior to age 65 are heavily loaded with impaired lives. The fact that these lives were not included in the comparison by occupation could have some effect on the figures. The rates for the combined active and service pensioners indicate, however, that any difference caused by not including service pensioners would likely be very small and that the results would not be materially changed. The coronary mortality rate for combined active and retired male employees included in this study was substantially the same, but slightly lower than for the general male population of the United States, both being based upon the same distribution of lives.

Summarizing the results of this study, there was no material difference in coronary mortality between the top management group and the craftsmen and laborers' group, but there was a marked difference between top management and middle management which is not explainable from presently available data. The popular notion that high executive positions are associated with high coronary mortality is likely due to the greater publicity connected with such deaths rather than to statistical facts. (Mortensen, J.M., Stevenson, T.T., Whitney, L.H., Mortality Due to Coronary Disease Analyzed by Broad Occupational Groups: A.M.A. Arch. Indust. Health, 19: 1-4, January 1959)

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Occupational Health and the Local Health Officer

To alert the health officer to opportunities presented by occupational health, some practicable yeardsticks should be developed to enable him to measure the strengths and weaknesses in his own situation. While these may serve as building blocks for local occupational health activity, they can rise only from the foundation of the health officer's personal interest. Four misconceptions account for the lack or stunting of this interest as reflected in the extremely slow growth of local occupational health activity over the past two decades.

First, occupational health still carries a limited connotation for many people. The health officer should be reminded that occupational health encompasses more than mine, mill, and factory. It embraces all places where people work including the farm. As the latter becomes more mechanized and as more and more toxic chemicals are employed, agricultural aspects of occupational health assume increasing significance.

Second, occupational health activity at the local level should not be confined to identification and control of harmful exposures in the working environment. Rather, it is concerned with health maintenance of the employed and it views various occupational groups not as captive groups, but as potential action bodies needing help to solve general health problems.

Third, industry is too often considered separate from community. In far too many areas both industry and the health department suffer through failure to communicate with each other.

The fourth misconception is that an occupational health program must necessarily be a specialized and separate activity of the health department. In large communities this may be desirable, but in smaller communities of less than 100,000 where the majority of local health departments are located, such activities may be carried out by the basic health department staff.

Occupational Health Self-Appraisal. To explore the practicability and desirability of extending the health department's services to the employed

population, the local health officer must be prepared to answer some fundamental questions.

What is the general health status of workers in the community? Information of this type may not be readily available for most health jurisdictions. If a specific determination cannot be made, experience from other areas may be helpful. For example, one health survey shows that:

For every 100 workers about 1220 days of disability because of illness are experienced annually or over 12 days per worker per year.

For every 100 workers there are 526 illnesses annually and 121 of them are disabling.

For every 100 workers there are about 62 accidents annually and 28 of these occur at work. Of these 62 accidents, 13 are disabling.

For every 100 "blue collar" workers there are about 68 accidents annually, about 40 of which occur at work. Although the average blue collar worker spends about one-fourth of his total time at work, almost two-thirds of his accidents occur at work.

What are some of the specific occupational health problems in the area? Here, the types of hazards reported by departments with established programs can serve as a guide. The health officer should look for: dermatitis-producing substances; toxicity due to solvents and other chemicals used in the factory, farm, and even in the home; and, hazards due to carbon monoxide, lead fumes and dust, silica dust, and noise.

What are the characteristics of the labor force? What is its size? How many women are there in it? What is the age and racial distribution? The employed group may be expected to amount to one-third or more of the population. Information of this type may be available from such sources as the publications of the U. S. Bureau of Census, the State Office of Employment Security or Economic Resources, and the local Chamber of Commerce.

If the community is larger than 250,000, larger industries will be found. Even in this larger plant group, however, the health officer cannot assume that all is well. Less than 1% will be of a size that can afford to have their own medical departments and fewer still will have industrial hygiene services of their own or through their parent company.

The local health officer can do much to encourage physicians in industry and in private practice, hospitals, and clinics to comply with any occupational disease reporting laws in effect. Through the local medical society, reporting of diseases can be encouraged by offering assistance in the epidemiologic investigation that may be required. Local programs frequently can be more effective than State programs in stimulating occupational disease reporting.

Integration of Occupational Health. Once having recognized the importance of extending health services to the employed population, the health officer must determine the resources that are available and assume the leadership role. There can be no substitute for personal effort—through visits to industries and attendance and participation in business, trade, and union meetings— to build

a good working relationship with management and labor. Close cooperation with the local medical groups is necessary in all health department operations. In occupational health this relationship assumes new importance because of sensitive economic and legal factors. Effective occupational health orientation of the health department staff depends upon the health officer's concept of how the program can best be integrated with other activities; his vision of the opportunity it offers for the furtherance of disease control, health education, nutrition, and other core programs through utilization of industrial grouping of adults; and the opportunities for training that he makes available to them. A growing number of local health departments are finding that with a minimum of training basic personnel can extend their services to places of employment.

In extending the department's services to industry, the local health officer will encounter situations requiring specialized help. Where can it be obtained? In all but nine States, State occupational health programs generally found in the health department are available to assist in defining or controlling an occupational health hazard, an industry-related community health problem, or in some cases, in assisting industry in establishing employee health programs. Supportive laboratory service is also available to him from the State agency.

In carrying on a limited occupational health activity, the local health officer need not be concerned with purchase of specialized equipment. Usually, State programs are equipped to lend such equipment as carbon monoxide indicators, radiation monitoring equipment, and temperature and humidity recorders. These instruments can be used in a satisfactory manner by local personnel after some training.

More detailed information will be found in a kit available to interested public health personnel without charge from the Occupational Health Program, Public Health Service, U.S. Department of Health, Education, and Welfare, Washington, D. C. This kit includes an occupational health self-appraisal form, a detailed guide for occupational health services in local health departments, a comprehensive outline giving specific examples of how involvement of industry and its employees can strengthen the local health department program and vice versa, and several statements describing the role of various local health department personnel in occupational health. (Magnuson, H. J., The Local Health Officer in Occupational Health: Am. J. Pub. Health, 49: 610-615, May 1959)

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Use of funds for printing the Medical News Letter, has been approved by the Director of the Bureau of the Budget, 19 June 1958.

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Directory of Poison Control Centers

A Directory of Poison Control Centers was compiled from information furnished to the National Clearinghouse for Poison Control Centers by State Health Departments. It includes those facilities which provide to the medical profession, on a 24-hour daily basis, information concerning the prevention and treatment of accidents involving ingestion of poisonous and potentially poisonous substances. Notation is made of those units which supply informational services only.

A limited number of this directory is available and may be procured without charge from the U. S. Department of Health, Education, and Welfare, Public Health Service, Accident Prevention Program, National Clearinghouse for Poison Control Centers, Washington 25, D. C.

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